I claim:

23. **A method** for reducing fuel density while increasing combustion air density, without effecting their specified volume, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels ~~(such as natural gas, propane gas and the like,)~~ in combustion mechanisms having a combustion area and at least one burner therein for converting said fuel into ~~(energy, such as)~~ heat, thrust, ~~(or)~~ torque, **or other energy**, comprising:

a) providing fluid hydrocarbon fuel as fuel for said combustion mechanism;

b) directing said fuel through the fuel supply conduit defining a first heat exchanger assembly that extends through a first heat transfer zone related to the combustion mechanism;

d) reducing the density of said fuel by heating the fuel as it flows through said first heat exchanger assembly to an optimal fuel operating temperature level ranging between ~~(100)~~ **165** degrees Fahrenheit and the fuel's flash point or auto ignition level;

i) maintaining a constant volume of density reduced fuel to the combustion area of said combustion mechanism;

j) providing combustion air for the combustion process in said combustion mechanism;

k) directing said combustion air through an air supply conduit defining a second heat exchanger assembly that extends through a second heat transfer zone; ~~(of said combustion mechanism)~~;

l) increasing the density of said combustion air by cooling the combustion air as it flows through said second heat exchanger assembly to an optimal air operating temperature level of between ~~(plus 50)~~ **ambient** and minus ~~(25)~~ **40** degrees Fahrenheit;

m) maintaining a constant volume of density increased combustion air to the combustion area of said combustion mechanism.

24. A method according to Claim 23, wherein the density reduction of the fuel is stabilised with an insulating or heat storage material forming part of the heat exchanger assemblies.

25. A method according to Claim 23, wherein at least one of said heat transfer zones is related to the exhaust gas vent area of the combustion mechanism.

26. A method according to Claim 23, wherein at least one of said heat transfer zones is related to the combustion area of the combustion mechanism.

27. A method according to Claim 23, wherein ~~(said)~~ **at least one of the** heat transfer zones ~~(are)~~ **is** operated from a source other than the combustion or exhaust gas vent area of the combustion mechanism.

28. A method according to Claim 23, wherein said preselected optimal fuel operating temperature range is within the preselected general fuel operating temperature range from ~~(125)~~ **165** degrees to 900 degrees Fahrenheit.

29. A method according to Claim 23, wherein the combustion mechanism converts the oxidation mixture of fuel and air into high temperature, high velocity combustion products to operate a single or dual cycle turbine system.

30. A method according to Claim 23, wherein the combustion mechanism is part of a combustion turbine.

31. A method according to Claim 23, wherein at least one of the two heat exchanger assemblies is operational.

32. A method according to Claim 23, wherein the fluid hydrocarbon fuel ~~(includes)~~ **is** a suspended **in air** coal dust, or a coal dust slurry.

33. A method according to Claim 23, wherein the fluid hydrocarbon fuel ~~(includes)~~ **is** a liquid fuel.

34. **A device** for reducing fuel density while increasing combustion air density, without effecting their specified volumes, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels ~~(such as natural gas, propane gas and the like)~~, in combustion mechanisms having a combustion area and at least one burner therein for converting said fuel into ~~(energy, such as)~~ heat, thrust, ~~(or)~~ torque **or other energy** comprising:

a) a fuel supply conduit defining a first heat exchanger assembly located in a heating zone related to the combustion area of the mechanism, providing the means to maintain a constant supply of fluid hydrocarbon fuel to the combustion area of said mechanism at a preselected optimal operating temperature level ranging between ~~(100)~~ **165** degrees Fahrenheit and the fuel's flash point or auto ignition level;

b) a combustion air supply conduit defining a second heat exchanger assembly located in a cooling zone related to the combustion mechanism, providing the means to maintain a constant volume of combustion air to the combustion area of said mechanism at a preselected optimal operating temperature level ranging between ~~(plus 50)~~ **ambient** and minus (~~25~~) **40** degrees Fahrenheit.

35. A device according to Claim 34, wherein an insulating material forms part of said heat exchanger assemblies in order to balance any temperature fluctuations occurring in the heat transfer zones.

36. A device according to Claim 34, wherein at least one heat transfer zone is related to the exhaust gas vent area of the combustion mechanism.

37. A device according to Claim 34, wherein at least one heat transfer zone is related to the combustion area of the combustion mechanism.

38. A device according to Claim 34, wherein the heat transfer zones are related to an operating source other than the combustion or exhaust gas vent area of the combustion mechanism.

39. A device according to Claim 34, wherein said means to maintain a continuous volume of **fluid hydrocarbon** fuel to the burners in the combustion area of the mechanism at said optimal fuel temperature level operates within a preselected operating temperature range between (~~125~~) **165** degrees and 900 degrees Fahrenheit.

40. A device according to Claim 34, wherein a preselected volume of combustion air is routed through a contained duct system which provides temperature control and the means for density increase of said combustion air volume by cooling the air to a preselected temperature range below ambient prior to combustion.

41. A device according to Claim 34, which provides the means for the combustion mechanism to convert an oxidation mixture of fuel and air into high temperature, high velocity combustion products for the purpose of operating a related turbine system.

42. A device according to Claim 34, wherein the fluid hydrocarbon fuel is a **fluid hydrocarbon** fuel other than natural gas or propane gas.

43. A device according to Claim 34, wherein at least one of the two heat exchanger assemblies is operational.